

phibian fauna of India, gave the distribution to be Assam, Kerala, Tamil Nadu and West Bengal. Sekar (1991) appended that *Microhyla rubra* is also found in Andhra Pradesh and Karnataka.

We report *M. rubra* from Sangli, Maharashtra. The specimen is in the collection of Western Regional Station, Zoological Survey of India, Pune. (Specimen No. : A/257; Date of collection: 12.9.79; collected by : Dr A.S. Mahabal; Locality : Wasumbe Tank, Vita, Sangli, Maharashtra; Det. by M.S. Ravichandran; snout to vent length : 17 mm).

Small size and fossorial habits (evident from enlarged metatarsal tubercle) are probably responsible for the inadequacy of our knowledge regarding the distribution of this frog. We concur with Daniel (1963) who had pointed out that the species is likely to be more widespread than the collection records

indicate. We also agree with Inger and Dutta (1986), that the actual distribution of many species of amphibians of our country is poorly known.

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24. EFFECT OF SEWAGE WATER ON DIFFERENT SPECIES OF AMPHIBIANS

To study the effect of sewage water on four species of amphibians, namely *Rana breviceps*, *R. cyanophlyctis*, *R. tigerina* and *Bufo andersoni* the present study was conducted at the World Forestry Arboretum, Jaipur from July 1991 to November 1991.

Many cemented tanks have been constructed at different corners in the Arboretum for irrigation and water storage. The domestic sewage water of Jawaharnagar, a suburb of Jaipur city, is first pumped into most of the cemented tanks and then used for irrigation. Only two tanks are used to store fresh water obtained from a tube-well.

During the rainy season, after the first heavy shower (i.e. first fortnight of July) amphibians become active and they move towards water-bodies for breeding. Many of them purposely or accidentally stumble into the tanks. It was noticed that when they fall in the vertical walled tanks,

they are unable to come out unless the tanks overflow.

Observations were made in seven sewage water tanks and two fresh water tanks (i.e. control) at about 7 a.m. daily to count the amphibians which died during the preceding 24 hours. As many as 20 to 25 days per month were covered for five months. All the dead amphibians obtained from the tanks were buried daily to clear the tanks for the next day. Data on the dead amphibians are given in Table 1.

A sample of sewage water taken from the main storage tank on 15th Nov. 1991 was sent to laboratory for chemical analysis. Details of analysis report are given below:

(1) pH	: 6.90
(2) Total suspended solids mg/L	: 250
(3) Total dissolved solids mg/L	: 931
(4) B O D (5 days 20°C) mg/L	: 224
(5) C O D mg/L	: 504

TABLE 1
DEATH OF AMPHIBIANS IN TANKS

Months	No. of dead amphibians in tanks							
	Rana breviceps		Rana cyanophlyctis		Rana tigerina		Bufo andersoni	
	sewage water	fresh water	sewage water	fresh water	sew. wat.	fre. wat.	sewage water	fresh water
Jul.-Aug.	5	-	-	-	-	-	12	-
Sep.-Nov.	31	-	-	-	-	-	47	-

(6) Sulphate (as SO ₄) mg/L	: 136
(7) Chloride (as Cl) mg/L	: 234
(8) % Sodium	: 57.76

It can be concluded from Table 1 and the water analysis report that sewage water is harmful to *Rana breviceps* and *Bufo andersoni*. Both these species are not as aquatic as *Rana tigerina* and *R. cyanophlyctis* but they survived well in the fresh water tanks. Perhaps *R. breviceps* and *B. andersoni* are more prone to exosmosis caused by

sewage water. During July and August the concentration of salts in sewage water becomes low due to dilution caused by rainwater. But after the rains are over there is little dilution and *R. breviceps* and *B. andersoni* start to die.

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25. NEW ADULT MALE ATTRACTANTS OF DANAID BUTTERFLIES

Earlier Amladi (1975) and Chaturvedi and Satheesan (1979) had reported adult Danaid butterflies visiting *Heliotropium indicum* and *Crotalaria retusa* for pyrrolizidine alkaloids and Monocrotolene respectively. While working on butterflies of Borivli National Park, I came across two plants, *Trichodesma indicum* R. Br. and *Paracaryum coelestinum* Benth. belonging to the family Boraginaceae attracting males of a few species of butterflies.

Trichodesma is an annual herb, much branched, hispid, 45-50 cm tall and bears pale violet blue flowers. Though it emerges during mid June and grows till December. The butterflies, namely *Euploea core* and *Euploea klugii* visit this plant from late August to October. On 23rd August I saw a *Euploea core* hovering around a *Trichodesma* plant and alighting near the top of the plant rather than on the flowers. A closer look revealed that the butterfly had un-

coiled its proboscis and was rubbing it on the hispid stem. When disturbed it flew around and returned to the same branch. Till September end main visitors to *Trichodesma* plants were *Euploea*'s. Later *Danaus genutia*, *Danaus chrysippus*, and *Tirumala limniace* were also seen visiting these plants and rubbing their proboscis on the hairy stems. In all cases butterflies invariably settled near the apical region of the plant. Individuals of two or three species were also seen on the same plant at a time. The time spent by these butterflies on a plant at a time. The time spent by these butterflies on a plant varied from a few seconds to 8 minutes.

According to Miller and Morris (1988) some *Trichodesma* species are, like the heliotropes, known to contain pyrrolizidine alkaloids. Apparently this may be the reason why males of the Danaid butterflies visited this plant to obtain an important precursor for the male pheromone.